

REMARKS

Claims 27 to 30 are added, and therefore claims 13 to 30 are currently pending in the present application.

It is respectfully submitted that all of the presently pending claims are allowable, and reconsideration is respectfully requested.

Applicants thank the Examiner for considering the filed Information Disclosure Statement and for acknowledging the foreign priority claim, as well as receipt of all certified copies of the priority documents.

Claim 26 was objected to because of a minor informality.

Although the objection may not be agreed with, to facilitate matters, claim 26 has been rewritten, as suggested. It is therefore respectfully requested that the present objection be withdrawn.

Claims 13 to 17, 21, 22, 24 and 25 were rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 6,347,269 to Hayakawa et al. in view of U.S. Patent No. 4,773,013 to Crapanzano et al.

To reject a claim under 35 U.S.C. § 103(a), the Office bears the initial burden of presenting a *prima facie* case of obviousness. *In re Rijckaert*, 9 F.3d 1531, 1532, 28 U.S.P.Q.2d 1955, 1956 (Fed. Cir. 1993). To establish *prima facie* obviousness, three criteria must be satisfied. First, there must be some suggestion or motivation to modify or combine reference teachings. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). This teaching or suggestion to make the claimed combination must not be based on the application disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991).

As clearly indicated by the Supreme Court in the *KSR* decision, it is “important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements” in the manner claimed. *See KSR Int’l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727 (2007). In this regard, the Supreme Court further noted that “rejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Id.*, at 1396. Second, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 U.S.P.Q. 375 (Fed. Cir. 1986). Third, the prior art

reference(s) must teach or suggest all of the claim features. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974).

Regarding the rejection of claim 13, it is respectfully submitted that any review of the applied reference makes plain that they do not disclose nor suggest the feature of an assumption of a constant gradient angle when estimating the vehicle mass as a function of time, as provided for in the context of the claimed subject matter. At page 3, lines 15-31, of the present Specification, it is explained that when a vehicle is traveling along any route, gradient angle α of the roadway is a function of time t and if one assumes the change in gradient angle $\alpha(t)$ is very small in time interval dt considered, the influence of gradient angle $\alpha(t)$ may be assumed to be constant for a time, so that gradient angle α may not have to be estimated, calculated or measured by a cost-creating sensor.

Contrary to the conclusory assertions in the Office Action, *the Hayakawa reference does not disclose or suggest that the gradient angle is assumed to be constant, but at best may indicate that the influence of the roadway inclination on the estimation of the vehicle mass might be eliminated by a high-pass filter.* (See Hayakawa, col. 6, lines 1-4).

Also, the Office Action cites the text at col. 5, lines 5-15, of Hayakawa, which refers to an equilibrium relationship in which \ominus *represents the change in the gradient*. Therefore the Hayakawa reference does not disclose nor suggest an equilibrium relationship, as between a motive force and a sum of an inertial force and drive resistances, in which the mass and a gradient angle of a roadway are included as quantities, with respect to time, assuming a constant gradient angle, as provided for in the context of the claimed subject matter.

Regarding the rejection of claim 16, Hayakawa does not in any way disclose nor suggest that mass is calculated from the recited equation: $m = \frac{dF / dt}{da / dt}$.

In particular, the Office Action refers to the text at col. 6, lines 26-38, of Hayakawa, which refers to equation 5. According to the Office Action at pg. 5, this equation can be solved for m in “instances where $e(k)$ [which represents the residual error due to the road gradient] is negligible it can be ignored”. However this is not the same as assuming that the gradient is constant (see col. 6, lines 37-39 of Hayakawa, “In the case that the residual error $e(k)$ is neglected”, and “In the case that the residual error $e(k)$ is not negligible”). It is therefore plainly apparent the Hayakawa reference does not disclose or suggest assuming a constant gradient angle, as provided for in the context of the presently claimed subject matter.

In short, the Office Action suggestion that it would be obvious to solve the equation for instances where the variation in road gradient is negligible and can be ignored is not the same as assuming that the gradient angle of the road will be constant as in the context of the presently claimed subject matter.

Regarding the rejection of claim 24, claim 24 includes features like those of claim 13 as explained above, and is therefore allowable for essentially the same reasons as claim 13.

Accordingly, claims 13 and 24, are allowable, as are their respective dependent claims 14 to 17, 21, 22 and 25.

Claims 18 to 20 and 26 were rejected under 35 U.S.C. § 103(a) as unpatentable over Hayakawa in view of Crapanzano and further in view of U.S. Patent No. 6,1647,357 to Zhu et al.

Claims 18 to 20 and 26 depend from claims 13 and 24 and are therefore allowable for the same reasons, since Zhu does not cure – and is not asserted to cure -- the critical deficiencies of the Hayakawa reference.

Claim 23 was rejected under 35 U.S.C. § 103(a) as unpatentable over Hayakawa in view of Crapanzano et al. and further in view of U.S. Patent No. 6,745,112 to Mori, “Floating-Point Computation Using a Microcontroller” by Randel et al., “Programming and Customizing the PIC Microcontroller” by Predko and U.S. Patent No. 6,567,734 to Bellinger et al.

Claim 23 depends from claim 13 and is therefore allowable for the same reasons, since the added references do not cure – and are not asserted to cure -- the critical deficiencies of the Hayakawa reference.

Furthermore, contrary to the assertions in the Office Action, Applicant’s respectfully submit that it would not have been obvious to calculate the reciprocal value of the mass in Hayakawa. Firstly, Hayakawa does not involve determining a vehicle dynamic which requires mass as a variable as in Mori, since Hayakawa refers to a vehicle *mass calculation device* that calculates the mass based on other variables. Secondly, in the presently claimed subject matter it is the calculating of the mass includes calculating both the mass and the reciprocal value of the mass. The Randal and Predko references only state that “in situations where a value is repeatedly used as a divisor, it is more efficient to determine the reciprocal value and use it as a multiplier”. (See Office Action at page 11 (emphasis added)). The

present application is directed towards the estimation of the mass of a vehicle, and therefore using a technique for reducing the computational load when repeatedly using mass as a divisor is not an obvious choice for improving the efficiency of methods for estimating the mass of a vehicle. Accordingly, claim 23 is allowable for this further reason.

Accordingly, claims 13 to 26 are allowable, and the obviousness rejections should therefore be withdrawn.

New claims 27 to 30 do not add any new matter and are supported by the present application, including the specification. Claims 27 and 28 depend from claim 24, and are therefore allowable for essentially the same reasons. Claims 29 and 30 depend from claim 13, and are therefore allowable for essentially the same reasons.

Accordingly, claims 13 to 30 are allowable.

CONCLUSION

It is therefore respectfully submitted that all of claims 13 to 30 are allowable. It is therefore respectfully requested that the rejections and objections be withdrawn, since all issues raised have been addressed and obviated. An early and favorable action on the merits is respectfully requested.

Dated: 3/10/2009

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